

PATENT
Atty. Dkt. No. APPM/001717.D2/PPC/ECP/CKIM
Serial No.: 10/611,589

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A method for annealing a copper layer, comprising:
forming the copper layer on a substrate by electroplating in a first chamber of an integrated processing system;

rinsing the substrate in a cleaning station of the integrated processing system;
~~and then~~

treating the copper layer in a gas environment in a second chamber of the integrated processing system, wherein the gas environment comprises nitrogen (N₂) and hydrogen (H₂); and

bringing the substrate in proximity to a cooling plate to cool the substrate to a temperature below about 100°C.

- 2-4. (Canceled)

5. (Previously Presented) The method of claim 1, wherein the hydrogen is present at a concentration of less than about 4% in the gas environment.

6. (Original) The method of claim 5, wherein the copper layer is treated for a time duration less than about 5 minutes.

7. (Previously Presented) The method of claim 6, wherein the copper layer is treated at a temperature of between about 200 to about 500°C.

8. (Original) The method of claim 7, wherein the gas environment comprises less than about 100 parts per million of oxygen.

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9. (Previously Presented) The method of claim 8, wherein the gas environment comprises a pressure of 760 torr.

10. (Canceled)

11. (Currently Amended) A method of annealing a copper layer, comprising:
forming the copper layer on a substrate by electroplating in a first chamber of an integrated processing system;

rinsing the substrate in a cleaning station of the integrated processing system;
~~and then~~

treating the copper layer in a gas environment at a temperature of between about 200 to about 500°C for a time duration of less than about 5 minutes in a second chamber of the integrated processing system; wherein the gas environment comprises nitrogen (N₂) and hydrogen (H₂); and

bringing the substrate in proximity to a cooling plate to cool the substrate to a temperature below about 100°C.

12. (Previously Presented) The method of claim 11, wherein the temperature is about 250°C.

13. (Original) The method of claim 12, wherein the gas environment further comprises less than about 100 parts per million oxygen.

14. (Previously Presented) The method of claim 13, wherein the gas environment comprises a pressure of 760 torr.

15-20. (Canceled)

21. (New) The method as claimed in claim 1, wherein the substrate is cooled to a temperature below about 80°C.

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22. (New) The method as claimed in claim 1, wherein the substrate is cooled to a temperature below about 50°C.
23. (New) The method as claimed in claim 1, further comprising maintaining the cooling plate at a temperature of about 5°C to about 25°C.
24. (New) The method as claimed in claim 11, wherein the substrate is cooled to a temperature below about 80°C.
25. (New) The method as claimed in claim 11, wherein the substrate is cooled to a temperature below about 50°C.
26. (New) The method as claimed in claim 11, further comprising maintaining the cooling plate at a temperature of about 5°C to about 25°C.